

DEPARTMENT OF THE ARMY
PROGRAM EXECUTIVE OFFICER
INTELLIGENCE AND ELECTRONIC WARFARE
PROJECT MANAGER, RADAR
FORT MONMOUTH, NEW JERSEY 07703-5000

MAINTENANCE BULLETIN

AN/TPQ-37 TRAILER	FILE NO. 127	REVISION
SUBJECT TRANSMITTER DEHYDRATOR PERIODIC INSPECTION/PMCS PROCEDURE	DATE 08/16/90	CATEGORY PMCS
SYSTEM AFFECTED ALL		

THIS BULLETIN ONLY APPLIES TO DIRECT SUPPORT SHOPS (DS)

1. REFERENCES:

- a. Maintenance Bulletin No. 111 dated 17 Aug 88 Transmitter Dehydrator Description.
- b. TM 11-5840-355-30-1, Direct Support Maintenance Manual, AN/TPQ-37 (V) Trailer.
- c. TM 11-5840-373-30-1, Direct Support Maintenance Manual, AN/TPQ-37 (V) 4 Trailer.
- d. Figure 101, Sheet 2, Transmitter Dehydrator, TM 11-5840-355-34P.
- e. Figure 96, Sheet 2, Transmitter Dehydrator, TM 11-5840-373-34P.

2. PROBLEM: Field reports have indicated that when the Transmitter Dehydrator malfunctions, damage may result to the Traveling Wave Tube (TWT) by permitting 'wet' air into the collector cover of the TWT causing arcing.

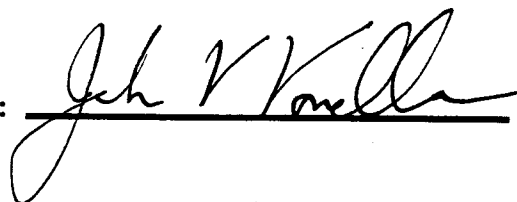
3. SOLUTION:

a. Direct Support Shop Officers upon receipt of this Bulletin will inspect the Transmitter Dehydrators to ensure normal operating condition. Thereafter a yearly inspection of Transmitters Dehydrators should be instituted. Use the attached procedure as a guide in conducting the inspections. Direct Support Technicians will make necessary repairs as needed.

b. The attached procedure contains a DEHYDRATOR INSPECTION CHECK LIST to facilitate completion of this task. Direct Support Technicians will fill-out this check list and forward results of inspection as required by the attachment.

4. CHANGES TO MANUAL: The applicable portion of the attached procedure that pertains to checking out the timer circuit will be added to the Transmitter troubleshooting section of TM 11-5840-355-30-1 and TM 11-5840-373-30-1 at the next update of the manuals.

APPROVED BY CHIEF LMD:

 , PMFF

DATE:

11/6/90

**TRANSMITTER DEHYDRATOR INSPECTION/PREVENTIVE
MAINTENANCE PROCEDURE**

DO NOT APPLY HIGH VOLTAGE

NOTES: 1. System must be energized through low voltage. (REFER TO PAGE 2-104 OF TM 11-5840-355-10-1 "TURNING SYSTEM POWER ON" OR PAGE 2-102 OF TM 11-5840-373-10-1.)

2. The canisters are cycled by the timer every four hours of system operation. Consequently, this task should be performed twice. (That is, perform steps a, b and c of Paragraph 3 below. Note the reading on the TWT filament time meter located in the Transmitter Power Distribution Panel. After the filament time meter has advance four hours repeat the steps.)

3. Use attached CHECK LIST to record/note results of this inspection and forward report to this office as required.

a. Inspect Moist Air Outlet

(1) Energize system through low voltage per instructions in Note 1 above.

(2) Locate the MOIST AIR OUTLET. It is located in the road side of the trailer. (See figure 1.)

(3) Inspect the MOIST AIR OUTLET for a discernible amount of air and/or moisture coming out of the opening.

(4) If no air comes out of the outlet, wait 15 minutes and recheck it. If air still does not come out of the outlet, de-energize the system and proceed to locate the trouble. (REFER TO PAGE 3-222 OF TM 11-5840-355-20-1 or PAGE 3-230 OF TM 11-5840-373-20-1 AS THE STARTING TROUBLESHOOTING FLOW CHART FOR THE TRANSMITTER DEHYDRATOR AND THEN USE THE FUNCTIONAL PAGES FOUND ON MAINTENANCE BULLETIN NO. 111 AND THE DIRECT SUPPORT MANUAL.)

b. Inspect Dehydrator Air Compressor Pressure Relief Valve.

(1) Remove trailer safety aisle cover.

(2) Remove transmitter cabinet top cover. (See figure 2.)

(3) Observe operation of pressure relief valve mounted on the transmitter dehydrator air compressor. (See figure 2.) Valve should vent air continuously for no longer than 10 minutes.

(4) If valve vents air for longer than 10 minutes, de-energize the system and remove the valve.

(5) Inspect valve for damage. (See figure 2.) Check for a loose poppet, damaged or missing hardware, or corrosion/debris around the poppet quad ring seal.

(6) If valve shows signs of damage, replace the valve. (Valve is item 26 of references 1d and e. mentioned on the cover of this bulletin.) If valve shows no sign of damage, re-install it.

(7) Re-energize the system and recheck operation of valve after replacement/re-installation. If valve continues to vent for longer than 10 minutes, de-energize the system and proceed to locate the trouble using references mentioned in paragraph a (4) above.

c. Inspect Air Supply to High Voltage Compartment.

- (1) Open door to the Transmitter Low Voltage Rectifier Compartment. (See figure 3.)
- (2) Disconnect the AIR INLET hose connection in the Low Voltage Rectifier Compartment. (See figure 3.)
- (3) Check for a discernible amount of air to be coming out of the AIR INLET hose.
- (4) If air is flowing, reconnect the hose connection and close compartment door.
- (5) If air is not flowing, wait 15 minutes and recheck it. If air does not come out of the inlet, de-energize the system and proceed to locate the trouble using references mentioned in paragraph a (4) above.

d. Check Out of Timer Circuit.

- (1) Figure 4 is the timing diagram for the dehydrator time M1. The timer can be anywhere in its cycle upon power on. By measuring the voltage between terminals TB1 and TB2 (See figure 2), it can be determined what phase in the cycle the dehydrator is in.
- (2) Check out of the circuit M1 can be accomplished by recording the voltages between TB1-8 and TB1-1 (Canister A1 Select), TB1-6 and TB1-1 (A1 Heater), TB2-8 and TB2-1 (Canister A2 Select) and TB2-6 and TB2-1 (A2 Heater) at 30 minute intervals over a five hour period.
- (3) Record the voltages on Table 1 and compare this table with the timing diagram in figure 4. In the five hour period the timer will change through all four states. Use Table 1 for recording readings.

WARNING

DO NOT TOUCH BARE METAL TO CHECK TEMPERATURE DURING THE NEXT STEP FEEL THE INSULATED PORTION OF THE CANISTER.

- (4) While the heater is ON (28Vdc on TB1-6 for A1 or TB2-6 for A2) the respective canister should be hot. Note the relative temperature (whether it is hot or not as felt by the touch of the hand) of the canister flange when the voltage readings are taken. (See figure 4 to determine when the canister should be hot).
- (5) If above requirements for the Timer Circuit are not met, the Sequential Timer, NSN 6645-01-070-0328 is suspected and should be replaced. Use references mentioned in paragraphs a (4) above, as an aid in troubleshooting.

AN/TPQ-37 DEHYDRATOR
INSPECTION CHECKLIST

PAGE 4 OF 5

1. In response to the AN/TPQ-37 Maintenance Bulletin #127 for Dehydrator Operation Verification, request you complete the inspection check list below and return as soon as possible to:

PM RADAR ATTN: SFAE-IEW-RD-FF CW4 W. Hammack
Fort Monmouth, NJ 07703-5000
DSN 996-5552 Data Fax: DSN 996-5270
Commercial 908-544-5552

2. As Maintenance Bulletin #127 states, field reports have indicated that Transmitter Dehydrator Malfunctions result in damaged TWTs which significantly increases the cost of maintaining readiness. PM RADAR requires this information to effectively track this problem and resolve it in the near future.

INSPECTION CHECK LIST

1. SYSTEM NO: _____

2. UNIT: _____ LOCATION: _____

3. DATE SYSTEM ARRIVED IN UNIT: _____

4. DATE OF INSPECTION: _____

5. NAME OF THE PERSON(S) PERFORMING THE INSPECTION: _____

6. a. DUTY POSITION OF PERSON PERFORMING INSPECTION: _____

b. TELEPHONE NO. WHERE YOU CAN BE REACHED _____

7. IAW ATTACHED MAINTENANCE BULLETIN THE FOLLOWING OBSERVATIONS WERE MADE:

a. Inspect Moist Air Outlet

(1) Does a discernible amount of air/moisture come out of the Moist Air Outlet?

YES _____ NO _____

NOTE: A discernible amount of moisture is described as your fingers are damp when rubbed together from the moisture exiting the Moist Air Outlet.

(2) If No, wait 15 minutes, Recheck

Does air come out ? YES _____ NO _____

b. Inspect Dehydrator Air Compressor Pressure Relief Valve.

(1) Does valve vent air continuously for more than 10 minutes? YES _____ NO _____

(2) If Yes, remove valve and inspect for damage.

(3) Does valve show signs of damage (loose poppet, damaged or missing hardware, or corrosion/debris around the poppet quad ring seal). YES _____ NO _____

(4) If Yes, describe observed damage: _____

C. Inspect Air Supply to High Voltage Compartment,

(1) Does a discernible amount of air come out of the Air Inlet Hose? YES _____ NO _____

(2) If No, wait 15 minutes and recheck.

(3) Does a discernible amount of air come out of the Air Inlet Hose? YES _____ NO _____

NOTE: A discernible amount of air is described as feeling any amount of air pressure on your fingers.

D. Is the Timer Circuit working properly? YES _____ NO _____

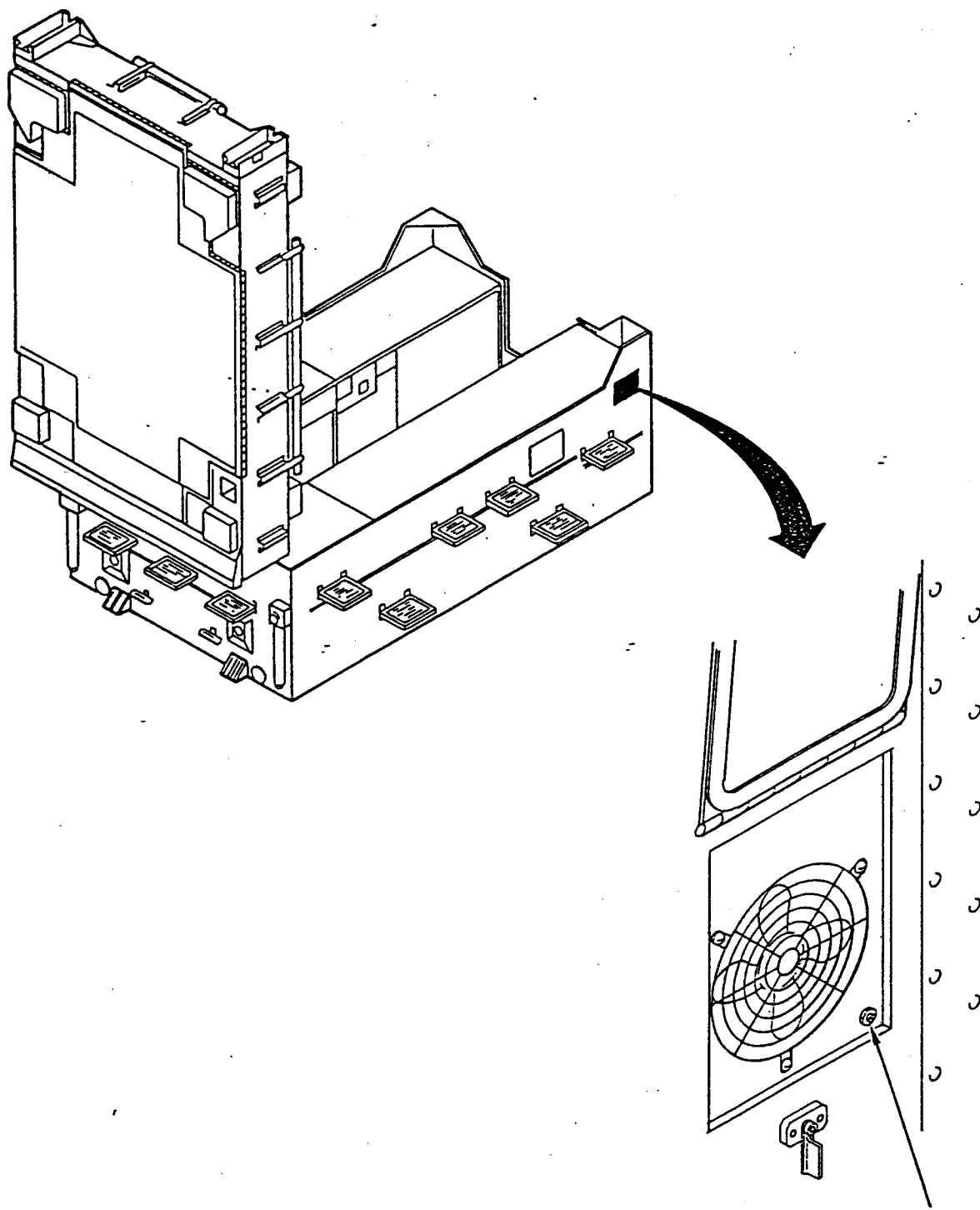


FIGURE 1

MOIST AIR
OUTLET

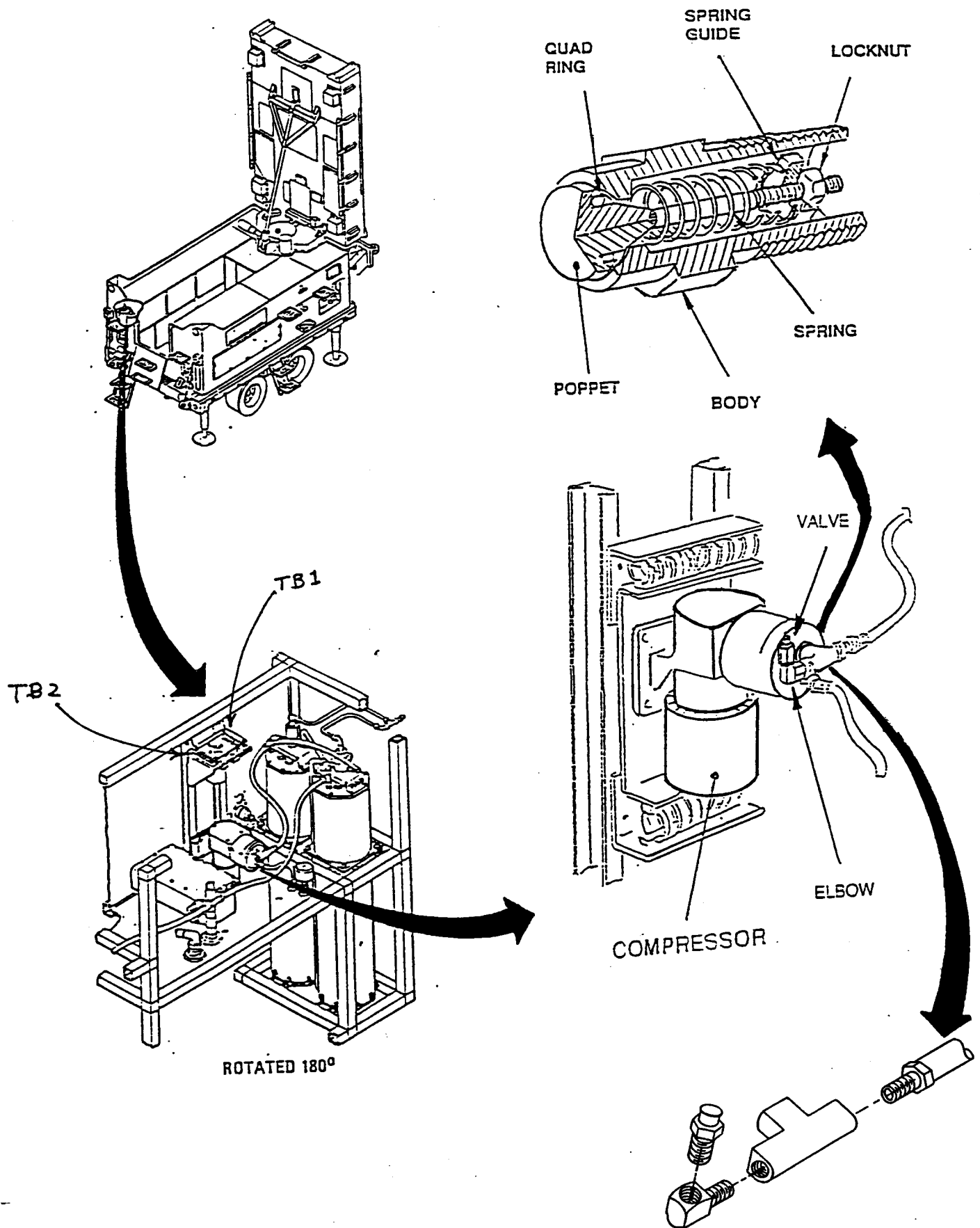


FIGURE 2

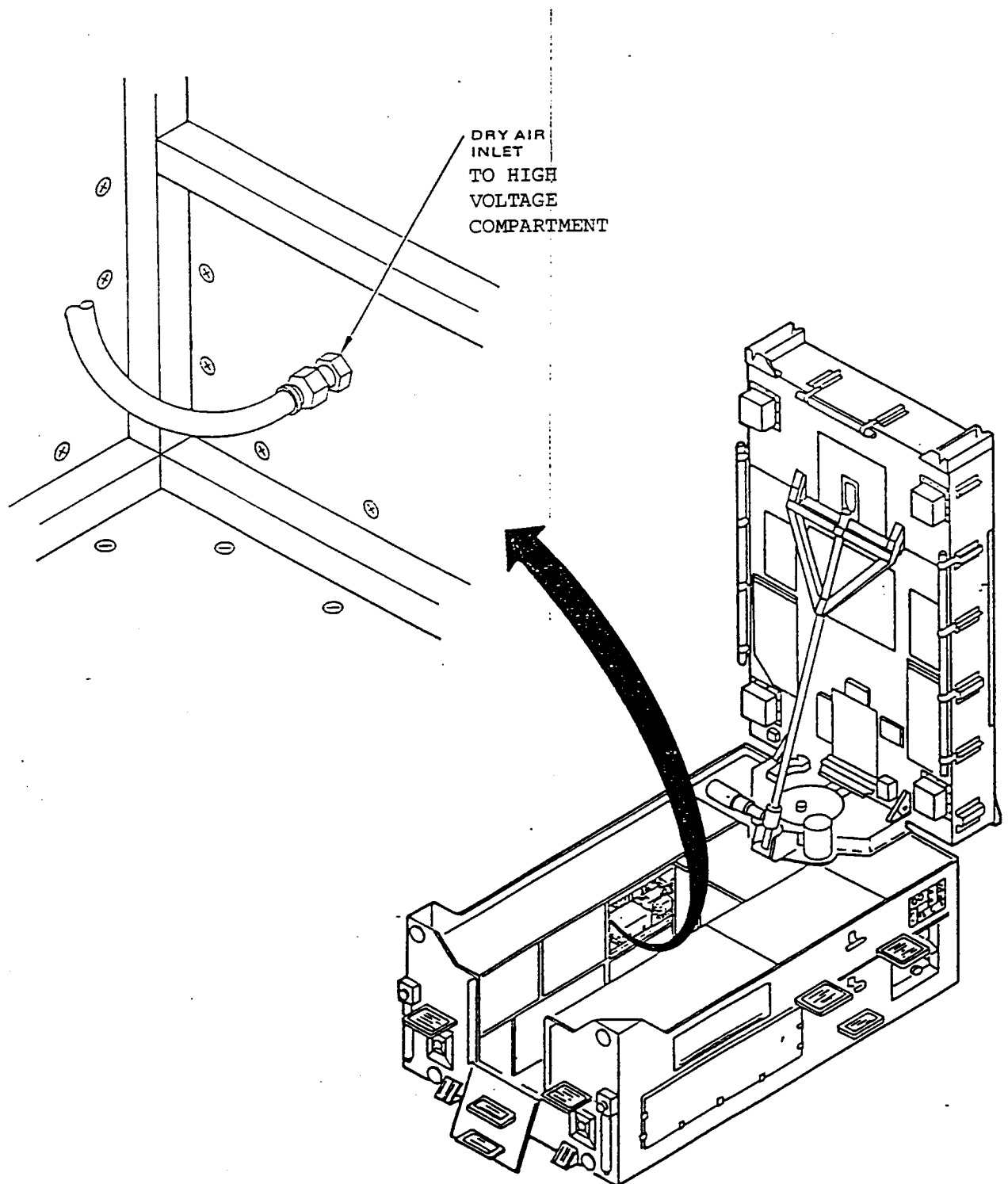
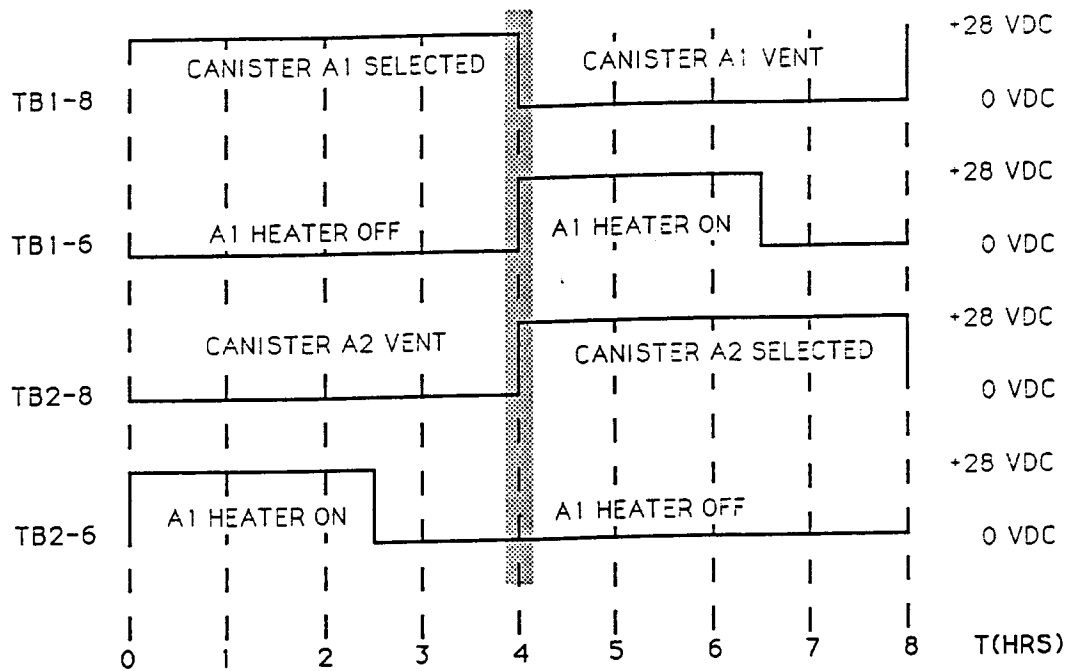


FIGURE 3




note:  Indicates a period of time when both canisters can be selected for approximately five minutes.

FIGURE 4.

RECORD TIME AND VOLTAGES

TB1-8										
TB1-6										
TB2-8										
TB2-6										
A1 TEMP										
A2 TEMP										
	0	1	2	3	4	5	6	7	8	5 HRS

TIME

TABLE 1

3. REQUIREMENTS

3.1 Pretreatment.

3.1.1 Fabrication operations. Prior to the application of any surface treatment or coating, all fabrication operations such as cutting, drilling, punching, forming, grinding, honing, welding, and joining shall have been completed, unless otherwise specified.

3.1.2 Surface finish. The surface finish of the basis metal shall be sufficiently smooth and free from surface defects, including those caused by improper handling or fabrication operations, so that the surface will not be detrimental to the functional use of the coating.

3.1.3 Preparatory cleaning. Prior to the application of any finish process, all surfaces shall be cleaned free from dirt, grease, oil, solder flux, welding flux, sand, visible rust, scale or oxides, and all other debris that might interfere with the intimate application of the finish. If plating or finishing processes are not performed immediately after the cleansing operation, suitable precautions shall be taken to maintain surface cleanliness during the period between the cleaning and the plating or finishing process.

3.1.4 Assembly operations. All requirements (except color requirements) of this specification shall be accomplished prior to assembly wherever possible. Color coatings (topcoats) shall be applied after major assembly work whenever possible. To facilitate manufacturing, topcoats may be applied at the system level.

3.2 Chemical film application. External surfaces made of nonferrous metals and alloys exposed to the elements shall not depend upon chemical film coatings alone for complete corrosion protection.

3.3 Color. All colors shall conform to FED-STD-595 or to the individual applicable specification. The topcoat color shall be green 383, unless otherwise specified herein or by the applicable contract or purchase order.

3.4 Coating systems.

3.4.1 Finishes and coatings shall be in accordance with those listed in the applicable table specified in table I or in 3.4.2.

3.4.2 Final paint coatings (topcoats) shall be in accordance with table V.

SIZE	FSCM NO.	DWG. NO.	
A	80063	SM-A-800519	
SCALE	LTR K	SHEET	4

3.4.3 Primers MIL-P-23377, MIL-P-53022, or MIL-P-53030 may be used as noted herein.

3.4.4 Filling engraved surfaces. When the filling of engraved surfaces is required in areas where a topcoat has already been applied, a clear finish conforming to MIL-C-22750, Type I, may be applied to prevent smearing of the existing topcoat before filling the engraved surfaces. The clear finish shall be consistent with the existing topcoat; i.e., when the topcoat is semi-gloss, the clear finish shall be semi-gloss; when the topcoat is lusterless, the clear finish shall be lusterless, etc.

4. QUALITY ASSURANCE PROVISIONS

4.1 The Quality Assurance provisions of the applicable specifications referenced in Tables II, III, IV, and V are applicable to this specification.

TABLE II. Shelter requirements.

Material	Item	Part or Surface	Surface Treatment		Top Coating	
			Treatment	Spec.	Material	Spec.
Aluminum and aluminum alloys	1-1	Exterior surfaces, new metal	Chemical film	MIL-C-5541 Class 1A	Primer plus color coat	MIL-P-23377, Type I 1/ Table V
	1-2	Exterior surfaces already painted (all primer undamaged)	Activate old paint with 50/50 ratio (by volume) mineral spirits/toluene	--	Color coat	Table V
	1-3	Interior surfaces, new metal	Chemical film	MIL-C-5541 Class 1A	Primer plus color coat	MIL-P-23377, Type I 1/ Table V
	1-4	Interior surfaces, new metal, for non-skid surfaces (floor)	Chemical film	MIL-C-5541 Class 1A	Primer plus non-skid color coat	MIL-P-23377, Type I 1/ MIL-W-5044 Type II Table V

DRAWING 43-105 30470-6

SIZE A	FSCM NO. 80063	DWG. NO. SM-A-800519
SCALE	LTR K	SHEET 5

TABLE II. Shelter requirements. (cont.)

Material	Item	Part or Surface	Surface Treatment		Top Coating	
			Treatment	Spec.	Material	Spec.
Aluminum and aluminum alloys (cont.)	1-5	Interior surfaces, already painted (floor)	Solvent clean with methyl ethyl ketone.	--	Non-skid color coat	MIL-W-5044, Type II Table V
	1-6	Parts to be fusion or resistance welded (spot, seam, or projection)	Clean	--	After welding, surface treat and coat per 1-1, 1-3, or 1-4.	--
	1-7	Chemical filmed surfaces to be fusion or resistance welded (spot, seam, or projection)	With a stainless steel brush, remove chemical film from surfaces to be welded. After welding the surface, treat and coat the surface per item 1-1, 1-3, or 1-4.			
	1-8	Hardware parts including fasteners, brackets, and other wearing surfaces, not threaded	Anodize per MIL-A-8625, Type III, Class I.	--	None	--
Ferrous alloys except corrosion resistant alloys	1-10	Exterior surface	Wash primer	DOD-P-15328	Primer plus color coat	MIL-P-23377 Type 1 1/ Table V
	1-11	Interior surfaces	Wash primer	DOD-P-15328	Primer plus color coat	MIL-P-23377 Type 1 1/ Table V
	1-12	Surfaces to be fusion welded	Clean	--	After welding surface, treat and coat per item 1-10 or 1-11, as applicable.	

SIZE A	FSCM NO. 80063	DWG. NO. SM-A-800519
SCALE	LTR 英	SHEET 6

DRAWING 42-105 35470-6

TABLE II. Shelter requirements. (cont.)

Material	Item	Part or Surface	Surface Treatment		Top Coating	
			Treatment	Spec.	Material	Spec.
Ferrous alloys except corrosion resistant alloys (cont.)	1-13	Hardware parts, including bolts, brackets, fasteners, hinges, nuts, rivets, screws, washers, etc.	Cadmium plate	QQ-P-416, Type II, Class optional	If color coat is required, coat per item 1-10 or 1-11.	
Corrosion resistant steels (minimum 12% Chromium)	1-15	All surfaces containing oxides or scale caused by welding or heat treatment, as well as surfaces to be passivated	Descale and passivate	QQ-P-35	None, or if protective color coating is required, apply wash primer plus primer plus color coat.	DOD-P-15328 MIL-P-23377, Type 1 1/ Table V
Copper and its alloys	1-20	All surfaces	Clean	MIL-C-10578	None, or if protective color coating is required, apply wash primer plus primer plus color coat.	DOD-P-15328 MIL-P-23377, Type 1 1/ Table V

1/ MIL-P-53030 or MIL-P-53022 primer may be used as an option to MIL-P-23377, Type 1 primer.

SIZE A	FSCM NO. 80063	DWG. NO. SM-A-800519
SCALE	LTR K	SHEET 7

TABLE III. Trailer requirements.

Material	Item	Part or Surface	Surface Treatment		Top Coating	
			Treatment	Spec.	Material	Spec.
Aluminum and its alloys	2-1	Exterior surfaces, new metal	Chemical film	MIL-C-5541 Class 1A	Primer plus top coat	MIL-P-23377, Type 1 1/ Table V
	2-2	Exterior surfaces, already painted	Sand blast to remove old paint and chemical film	MIL-C-5541 Class 1A	---	---
	2-3	Interior surfaces not color coated	Chemical film	MIL-C-5541 Class 1A	---	---
	2-4	Parts to be fusion welded (seam or projection)	Clean	---		After welding surface, treat and coat per item 2-1 or 2-3 as applicable.
	2-5	Chemical filmed surfaces to be fusion or resistance welded (spot, seam, or projection)	With stainless steel brush, remove chemical film from surfaces to be welded. After welding, surface treat and coat per item 2-1 or 2-3, as applicable.			
	2-6	Exterior surfaces, for non-skid surfaces (floor)	Chemical film	MIL-C-5541 Class 1A	Primer plus non-skid color coat	MIL-P-23377, Type 1 1/ MIL-W-5044, Type II, See Table V.
Ferrous alloys except corrosion resistant alloys	2-8	Exterior surfaces	Sand blast	TT-C-490 Method I	Wash primer plus primer plus color coat or primer plus color coat	DOD-P-15328, MIL-P-23377, Type 1 1/ Table V
	2-9	Exterior surfaces already painted				
	2-10	Interior surfaces				
	2-11	Surfaces to be fusion welded				
					After welding, sandblast and coat per item 2-8 or 2-10.	

BRUING 40-105 39478-6

SIZE A	FSCM NO. 80063	DWG. NO. SM-A-800519
SCALE	LTR K	SHEET 8

TABLE III. Trailer requirements. (cont.)

Material	Item	Part or Surface	Surface Treatment		Top Coating	
			Treatment	Spec.	Material	Spec.
Ferrous and alloys except corrosion resistant alloys (cont.)	2-12	Hardware parts including bolts, brackets, fasteners, hinges, nuts, rivets, screws, washers, etc.	Cadmium plate	QQ-P-416, Type II, Class optional	If color coat is required, coat per item 2-8 or 2-10.	
Corrosion resistant ferrous alloys	2-15	All surfaces containing oxide or scale caused by welding or heat treatment and surfaces to be passivated	Descale and passivate	QQ-P-35	None, or if protective color coat is required, apply wash primer plus primer plus color coat	DOD-P-15328, MIL-P-23377, Type 1, Table V
Copper and its alloys	2-20	All surfaces	Clean	MIL-C-10578		

1/ MIL-P-53030 or MIL-P-53022 primer may be used as an option to MIL-P-23377, Type I primer.

TABLE IV. Radome requirements.

Material	Item	Part or Surface	Surface Treatment		Top Coating	
			Treatment	Spec.	Material	Spec.
Teflon glass cloth	3-1	Radome, exterior	Etch	AMS2491	Primer plus top coat	MIL-P-23377, Type 1 1/ Table V
Polyester glass cloth alloys	3-2	Radome, exterior	Scuff-sand entire surface	---	Color coat	Table V

BRUNING 40-105 39478-6

SIZE A	FSCM NO. 80063	DWG. NO. SM-A-800519
SCALE	LTR K	SHEET 9

TABLE IV. Radome requirements. (cont.)

Material	Item	Part or Surface	Surface Treatment		Top Coating	
			Treatment Spec.		Material	Spec.
Teflon glass cloth	3-3	Radome, exterior (color impregnated)	None	---	None	---

1/ MIL-P-53030 or MIL-P-53022 primer may be used as an option to MIL-P-23377, Type I primer.

TABLE V. Color requirements.

Item	Equipment	Surface	Material and Color
4-1	Shelter-Exterior	All exterior surfaces	Apply top coat of MIL-C-46168, Type II or III polyurethane, thickness 1.8 mils, min. per MIL-T-704. Colors shall be as specified in paragraph 3.3.
4-5	Radome--PTFE glass cloth (TPQ-36)--excluding color impregnated radomes	All exterior surfaces	Apply top coat, MIL-E-52798 enamel, thickness 1.5 to 2.5 mils per MIL-T-704.
	All other radome materials--excluding color impregnated radomes	All exterior surfaces	Apply top coat of MIL-C-46168, Type II or III polyurethane thickness 1.8 mils min. per MIL-T-704. Colors shall be as specified in paragraph 3.3.

BRUNING 40-105 39478-6

SIZE A	FSCM. NO. 80063	DWG. NO. SM-A-800519
SCALE	LTR K	SHEET 10

TABLE V. Color requirements. (cont.)

Item	Equipment	Surface	Material and Color
4-2	Shelter-Interior	All interior walls, ceilings, ductwork, and non-removable structures	Apply top coat of MIL-C-22750, Type I, color light green, No. 24533 per FED-STD-595, in accordance with MIL-C-27751.
4-3		Floors, non-skid	Apply two thick brush coats of MIL-W-5044, Type II, color No. 36118 per FED-STD-595.
4-6	Shelter-Interior	Exposed surfaces of units, panels, and doors	Apply top coat of MIL-C-22750, Type I, color No. 26307 per FED-STD-595, in accordance with MIL-C-22751.
4-7	Shelter and Trailer	Internal steel surfaces of equipment enclosures; none required on aluminum and CRES parts	
4-4	Trailer-Exterior	All exterior surfaces	Same as 4-1
4-8	Trailer-Exterior	Floors, non-skid	Apply two thick brush coats of MIL-W-5044, Type II. Colors shall be as specified in paragraph 3.3.

5. PACKAGING

5.1 This section is not applicable to this specification.

6. NOTES

6.1 This section is not applicable to this specification.

SIZE A	FSCM NO. 80063	DWG. NO. SM-A-800519
SCALE	LTR. K	SHEET 11